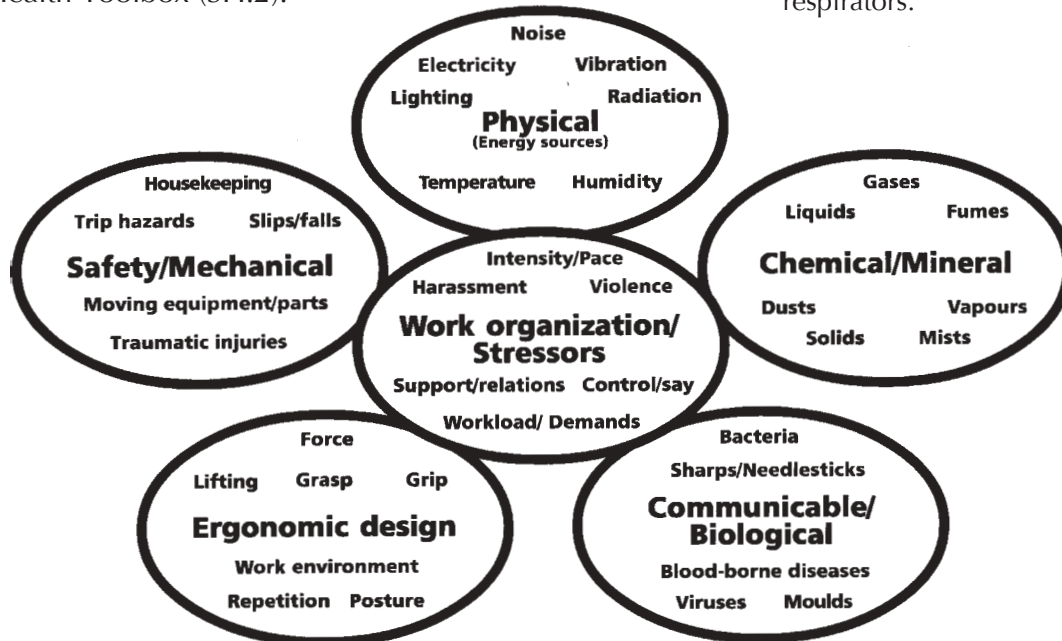


Part E. Step 2 - What makes it hurt?

E.1 What's it all about?

Work-related symptoms are the result of exposure to workplace hazards. For health symptoms, hazards are the “factors promoting ill health” named in the goals of the *Workplace Safety and Health Act*.

We put safety and health hazards into six categories. The categories overlap because of context, how people experience the problem or the fact that some specific hazards fit in more than one category. See *Hazards - the problems behind our symptoms* in the Safety and Health Toolbox (SH.2).



Chemical/mineral hazards - includes the basic forms of matter and what they can become - solid, liquid, gas, vapour, fume, dust, mist

Note - vapours are the gas form of liquids; a fume is very small airborne particles that have cooled from a very hot vapour (usually from metal). You need to know the difference between a vapour and a fume when designing ventilation systems or selecting respirators.

Safety/mechanical hazards are not physical hazards. They tend to be very obvious, and to have acute effects. The traumatic injuries caused by these hazards range from minor cuts to death. Examples include:

- slippery floors
- uneven surfaces
- poor or no machine guards
- being unable to see where you're going
- poorly-maintained equipment or tools
- twisting roads or foggy areas (leading to vehicle collisions)

Communicable/biological hazards - are the “bugs” from contact with other people (viruses and bacteria), moulds, sharps and needle sticks, blood-borne diseases (e.g. hepatitis, HIV).

Ergonomics can be defined as the “law of work”, where the goal is to fit the job to the worker, not the other way around.

Physical hazards come from energy sources. They also fit into the work environment sub-category of ergonomic design hazards. The effects of many physical hazards tend to be acute, ranging from sweating in humid, hot environments to death by electrocution. They also have long-term effects. Noise can cause deafness and cardiovascular or blood pressure problems. X-rays can cause cancers while ultraviolet radiation causes sunburns and is also linked to skin cancer.

Other physical hazards include

- some indoor air quality (IAQ) problems
- temperature or humidity problems
- vibration (“white hand” or “Reynaud’s”)
- accessible “live” wires
- working in cold or hot conditions
- microwave towers

Chemical and mineral hazards have both acute and chronic effects. The symptoms from exposure depend on the substance. Some symptoms are not easy to “see” or connect to the hazard.

Others affect several systems or parts of the body. For example, lead can cause stomach pain, high blood pressure, problems having healthy kids, and a wide range of central nervous system effects (e.g. headaches, irritability, moodiness, concentration problems). Other chemicals cause allergies (e.g. latex, isocyanates) so that people exposed to them always have a reaction, whatever the level in the environment.

Chemicals and minerals come in a variety of forms. They include materials such as ammonia, asbestos, carbon monoxide, nickel, organic solvents (e.g. toluene, ketones) and welding fumes.

Consult specific material safety data sheets (MSDSs) or the *Resource Guide* to find out specific symptoms linked to the chemicals and minerals used in your workplace.

Communicable or biological hazards aren’t just linked to health care jobs. What about our co-workers? Anyone dealing with the public also is exposed to this hazard group. It includes viruses and bacteria, contaminated sharps and needles, mould, fungus, or allergies to biological substances.

Ergonomic design hazards - caused by the design and organization of the job, tools, equipment and workplace. Sub-categories include force, posture, repetition, work environment and stressors/work organization hazards. Other issues include the design of signals, gauges and switches, use of colour, design of monitors, other screens and controls.

Force - the amount of pressure a worker uses for a task. It includes pushing, pulling, lifting, vibration and contact stress.

Material safety data sheets (MSDSs) - information sheets about product ingredients, their hazards and symptoms, and ways to avoid exposure. Required for “controlled products” under the Workplace Hazardous Materials Information System (WHMIS). MSDSs must be provided before controlled products are used/stored in a workplace.

Physical hazards - are from energy sources, including electricity, humidity, lighting, noise, radiation, temperature, vibration, pressure.

Posture: - positions in which people work. Awkward and static positions can lead to aches and pain.

Repetition - doing the same motion over and over, without adequate rest, especially mini-breaks.

Safety/mechanical hazards - includes issues such as slip, trip and fall types of problems, machinery with moving parts and housekeeping problems.

Work environment ergonomic hazards - part of the general work environment, sometimes also considered as physical hazards.

These hazards can have both acute and chronic/long-term effects, depending on the substance. To find out about specific ones, see the *Resource Guide*.

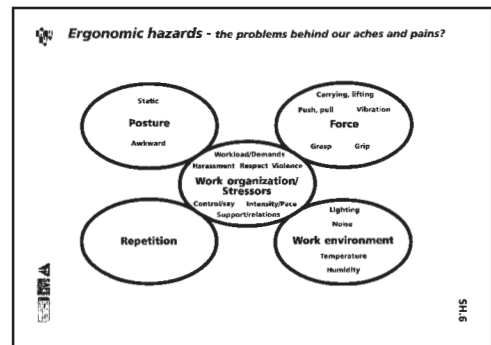
Ergonomic design hazards usually are linked to MSIs. The effects can be short-term but many take time to develop and heal, especially if the exposure continues because the hazard is not fixed. The damage can be permanent. There are five sub-categories of ergonomic hazards [see *Ergonomic hazards - the problems behind our aches and pains* chart (SH.6) in the Safety and Health Toolbox.]

The strain of **force** can cause damage to body parts or tissues. Contact stress occurs when a tool handle or edge digs into the soft tissue of the palm of the hand, the hand is used as a hammer, or someone works on their knees. The contact concentrates force on a small area, putting pressure on those tissues, sometimes injuring them.

Vibration is a force found in some tools and equipment. It affects the hands and arms by damaging the nerves and/or blood vessels so that hands/fingertips go numb and cannot be used easily (sometimes called white hand or Reynaud's). Whole body vibration (e.g. from driving a truck) is linked to back disease. Other force hazards include lifting heavy boxes or objects, moving people (especially without mechanical help) pinch grips and pulling or pushing heavy objects.

There are two kinds of **posture** hazards. Awkward posture is working in positions that feel uncomfortable. It could be using your arms over your head, twisting, bending or reaching, or working with a bent back, bent wrist, etc. This can stretch a person's physical limits, compress nerves and irritate tendons.

Working with your body or (part of) a limb in one position without a break is a static posture. Constant standing or sitting, or holding your arm, neck or shoulder in one position, can restrict blood flow and damage muscles. Other unhealthy postures include working with arms above your head, working with bent joints, standing or kneeling for a while, or working with your neck cricked to see the computer screen.



Repetition overuses the muscles, tendons, and other soft tissues used for the motion. It can irritate tendons and increase pressure on nerves and may cause permanent damage. Examples of repetition hazards include traditional assembly line work, data entry, piecework sewing, using a hammer continuously etc.

Work environment hazards are part of the general work environment or may be physical hazards on their own. Working in cold temperatures can cause stiff joints, loss of dexterity and make you more likely to drop things. Noise interferes with concentration and the ability to hear and understand people's words and other sounds. Poor lighting can lead to poor posture as you try to read material on a computer screen (e.g. because of glare).

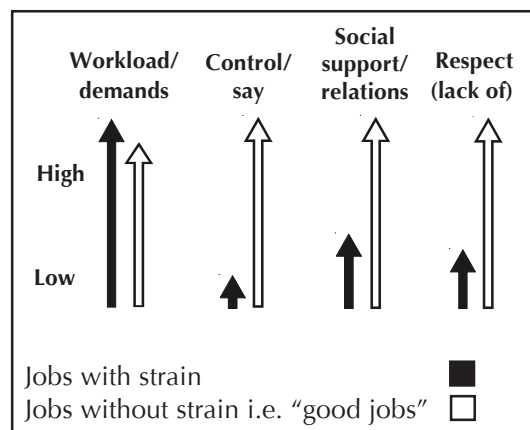
Work organization hazards/stressors are linked to MSIs, and can set us up for these kind of injuries in the neck, shoulders and lower back. The links include the presence of stressors or work organization issues in general, "flexible" work arrangements (just-in-time production and "quality circles"), low satisfaction with the physical work station setup, muscle tension from stressors, and lack of rest (including breaks).

These hazards are at the centre of the hazards chart because they often are the reason behind many other hazards. (See *Root cause analysis and the 5 Whys*, CP.16 in the Committee Process Toolbox, and in Part F.) For example, if the speed of a job is increased to maximize production, workers likely have to do more work - more repetitive motions, perhaps in more static postures, using more force, etc. In other situations, deadlines or production quotas can cause muscles to tense up, adding to wear and tear on soft tissues and increasing the chances of getting MSIs.

The general category of work organization hazards/stressors are linked to the symptoms of stress and job strain/toxic stress. There are four sub-categories:

- workload/demands (especially too much)
- control/say about your job and activities
- support/social relations at work
- respect (lack of).

The graphic at the right shows how these four categories work together to cause toxic stress.



Job strain or toxic stress - The dark arrows in the diagram show the combination of factors that are generally accepted to cause job strain. Some people call the main part of this "model" the Demand-Control-Support approach to work-related toxic stress. Studies show that people with job strain have higher blood pressure, more cardiovascular diseases (i.e. of the heart and blood systems) and are more likely to have heart attacks or *karoshi* (a specific kind of stroke linked to very long hours of work and/or very high workload).

The "model" also shows a way forward. Good jobs are those with:

- plenty of work or demands, but not too much;
- lots of control or say about what they do, how they use their skills, etc.;
- support from all levels of the organization; and
- respect from all those they deal with at work.

For more information about this topic, see the "Stressors, work organization hazards" section in the *Resource Guide*. For some recent Canadian studies, see Statistics Canada's 2007 report about work-related stress and strain at <http://www.statcan.ca/english/freepub/75-001-XIE/2007112/articles/10466-en.htm>, and a 2006 study in which lack of respect was an important reason for nurses' ill health (<http://www.statcan.ca/Daily/English/061211/d061211b.htm>).

Examples of work organization hazards/stressors include:

- deadlines, especially when there are a lot and/or they are unrealistic
- not enough staff for particular jobs
- poor labour relations
- too much or too little work
- no say about what you do or how you do it
- racism or other kinds of discrimination and harassment
- violence and potential for it
- no flexibility for non-work responsibilities (e.g. to care for children or seniors)
- working alone or in isolation.

E. 2 Why is this step important?

Legally, committees, reps and their employers must deal with all six hazard categories. In practical terms, symptoms and hazards are connected. With information about the links, committee members and their employers know that they are dealing with - or getting closer to - the root cause of a problem. (See root cause analysis in Part E.)

Prevention measures usually require knowing the hazard(s). However, the precautionary and substitution principles from the *Prevention triangle* give us grounds to rely on symptoms alone, if need be. They also remind us that it doesn't make sense to measure "how much" of a hazard exists if we can do something to reduce or get rid of the problem.

E. 3 What tools can we use to learn more about hazards in our workplace?

- ✓ Hazard categories chart (SH.2)
- ✓ Ergonomic hazards categories chart (SH.6)
- ✓ Inspections (SH.3, 4 & 5)
- ✓ Workplace maps (SH.12)
- ✓ Surveys
- ✓ Interviews and conversations (CP.12 A & B)
- ✓ SOBANE screening tool for ergonomic hazards (SH.9)
- ✓ Root cause analysis and the 5 whys (CP.16)



COMMITTEE ACTIVITY

Hazard categories

1. Start by brainstorming a list of hazards in the workplace. Have one or two people keep track of the list on post-its or cards. Each hazard should go on one post-it or card. Get a list of about 20.
2. Divide the committee into groups of three or four. Give each group up to five hazards each. They also need a copy of SH.2, *Hazards – the problems behind our symptoms*.
3. Each group has about five minutes to name the category in which their hazards "fit", and be prepared to explain why. If the group cannot agree quickly, name the categories where the hazard might go.
4. When time's up, each group reports their "results" and explains why they put the hazard in its category. They also ask if the rest of the committee agrees with their categories. Discuss as need be to get consensus. Use SH.2 and the text in this Part to help decide.
5. Group all the hazards by category. Discuss what you see.

For more ideas about how to find hazards, see the committee activity and Part F.

E. 4 Next steps

To find out more about hazards, committee members or reps can:

- do employee surveys about symptoms and what workers think cause them
- analyze all sources of information about symptoms and research possible causes
- brainstorm lists of hazards by category, area, or job, within the committee and/or with groups of employees
- do workplace inspections by category, area, or job
- use the inspection sheets (SH.5) during inspections, to keep track of the results and to start making a case for “fixing” the hazards
- look for hazards during investigations and keep track of them by category
- review MSDSs and put substances into priority categories
- look for “really nasty” chemical, biological and physical hazards, based on their effects (e.g. the ability to cause cancer, affect reproductive systems, affect pregnant or nursing workers, cause allergies and allergic reactions, cause gene mutations)
- classify hazards by their ability to explode, catch fire or have environmental effects, and then try to eliminate them or reduce the amounts used or stored
- make workplace maps - within the committee or with groups of employees
- keep an inventory of hazards they find in their workplace and share it with the employer.

For details about these activities, see Part F and/or the *Resource Guide*.



COMMITTEE ACTIVITY

Connect symptoms and hazards using your body map. (See the committee activity in Part D).

Print off a copy of the *Hazards - the problems behind our symptoms* (SH.2) and *Ergonomic hazards - the problems behind our aches and pains* (SH.6).

For each spot on the body map, determine the hazard causing it. Match the causes behind each spot with a hazard category. Brainstorm all possible causes, being as specific as possible.

For example, workers with shoulder or neck problems may say their symptoms come from working with their arms above their shoulders or using a computer monitor. These answers fit in the ergonomic design circle. Symptoms like a stuffed-up nose and runny eyes might be caused by low humidity - a physical hazard - or ammonia, which is a chemical hazard.

E. 5 What's the law say about hazards? Who has to do what?

Who?	What are they supposed to do?	WSH Act	WSH Regulation
Employer	provide & maintain safe & healthy workplace	4(2)(a)	
	tell pregnant/ nursing workers of hazards that may affect them or unborn/nursing child		2.5
	tell workers/supervisors about safety & health hazards in workplace	4(2)(c)	
	have program with procedures to protect safety & health	7.4(5)	
	work with the committee/rep to identify hazards	40(10)(b)	
	give medical professionals information on "controlled products" in an emergency		35.19
	tell workers/supervisors about:		
	- musculoskeletal injuries (MSIs)		8.2
	- if violence may occur at work		11.2(2)
	- noise between 80 & 85 dBA		12.3(a)
	- if noise not below 85 dBA from machines or tools		12.4(2)(a) 16.3(a)
	- radiation, but not devices covered by <i>Nuclear Safety & Control Act</i> or given to medical/dental patients		18.4
	- the "rated load" for scaffolds and suspended platforms		28.13(1)(b)(i) 28.28(b)
- hazards of "controlled products"/WHMIS products		35.3	
- asbestos		37.6(2)	
- hazard for which protective equipment is designed		6.4(c)	
- inventory of materials containing asbestos and inspect annually		37.2(1)	

The authors' wording presented above does not replace the Province of Manitoba's legislated Act and Regulations. The official versions can be found on-line at <http://www.gov.mb.ca/labour/safety/actregnew.html> or by contacting the Manitoba Workplace Safety and Health Division office.

Who?	What are they supposed to do?	WSH Act	WSH Regulation
Supervisor	tell workers about all hazards in area where work is done	4.1(b)	
Workplace safety & health committee/ representative	deal with safety and health concerns/complaints	40(10)(a)	
	identify safety & health hazards	40(10)(b)	
	inspect the workplace regularly	40(10)(h)	
	work with the employer to develop an overall program	40(10)(c)	
	review chemical or biological substances information		36.2(1)
	can request & must receive reports on tests, inspections, investigations, measurements	41.2	
	examine log book, inspection report or other documents employers must keep		3.12
	have access to MSDSs		35.12,
must not disclose worker's personal health information		35.21(2) 3.14	

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